

TECHNICAL SPECIFICATIONS

PRELIMINARY
DAVISVILLE

JANUARY, 1981

prepared for

RHODE ISLAND
ECONOMIC DEVELOPMENT

FC
365
098
1981



Planners

1001 L. Howard Street, Providence, Rhode Island 02903

RHODE ISLAND PORT AUTHORITY AND
ECONOMIC DEVELOPMENT CORPORATION

OUTLINE TECHNICAL SPECIFICATIONS

OF

PRELIMINARY ENGINEERING
DAVISVILLE PORT EXPANSION

JANUARY, 1981

CE MAGUIRE, INC.
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SECTION 02050 - DEMOLITION

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Demolition required for this work includes, but is not necessarily limited to:

1. Removal of concrete and bituminous pavement and concrete walls.
2. Stripping and stockpiling of all topsoil material.
3. Removal of existing structures including walls, roofs, floors, doors, windows, interior partitions, foundations, ceilings, heating and ventilating, piping, and electrical complete.
4. Removal of all debris.
5. Disposal of all materials off site.

PART 2.00 - MATERIAL

2.01 MATERIALS

All materials, not specifically described but required for proper completion of the work of this section, shall be as selected by the Contractor and approved by the Contracting Officer.

PART 3.00 - EXECUTION

3.01 Work Included:

Will consist of the removal of all specified materials to the lines and grades as shown on the Contract drawings or as specified in the contract documents.

END OF SECTION

SECTION 02110 - CLEARING AND GRUBBING

PART 1.00 - GENERAL

1.01 DESCRIPTION:

A. Work Included:

The work covered under this Section includes the furnishing of all labor, equipment and materials, and performing all operations in connection with the clearing and grubbing and the preparation of the site within the limits of the construction shown on the drawings. The work also includes the disposal off the site of materials resulting from clearing and grubbing and site preparation operations, and all appurtenant work, complete in accordance with the specifications and the drawings, and as directed.

B. Related Work Specified Elsewhere:

- | | |
|--|---------------|
| 1. Stripping, Stockpiling and
Replacing Topsoil | Section 02113 |
| 2. Earthwork | Section 02200 |

PART 2.00 - EXECUTION

2.01 CLEARING:

A. Clearing:

Clearing shall include the felling and cutting up of all trees, and the satisfactory removal and disposal of trees, downed timber, brush and debris and obstructions of any nature. Individual trees directed to be left standing shall be protected in a satisfactory manner to prevent damage incident to construction operations.

2.02 GRUBBING:

A. Grubbing:

Grubbing shall include the satisfactory removal and disposal of all stumps, roots larger than one inch in diameter, matted roots, debris and other obstructions to a depth not less than 18 inches below finish grades, except that in areas to be occupied by structures they shall be removed in their entirety. All depressions resulting from grubbing shall be refilled with selected materials from earth excavation, graded and compacted so as to conform to adjacent ground surfaces.

2.03 DISPOSAL OF CLEARED AND GRUBBED MATERIAL:

A. Disposal of Cleared and Grubbed Material:

All timber, stumps, roots, brush, and other debris, obstructions and objectionable material resulting from clearing and grubbing and site preparation operations shall be removed and disposed of by the Contractor off the site. Disposal by burning or burying on the site will not be permitted.

END OF SECTION

SECTION 02113 - STRIPPING, STOCKPILING & REPLACING TOPSOIL

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. The work covered under this Section includes the furnishing of all labor, equipment and materials and performing all operations in connection with the stripping, stockpiling and replacing of topsoil within the limits of the areas as indicated or directed, completed and accepted, in accordance with the drawings and specifications. The work shall also include all hauling, handling and rehandling of topsoil, maintaining and protecting of stockpiled topsoil; preparation of subgrades; spreading; compacting, grading and replacing deficiencies in quantities of topsoil; protection of completed topsoiled areas; and all other work incidental and necessary for the satisfactory completion of this Section.

B. Related Work Specified Elsewhere:

- | | |
|--------------------------|---------------|
| 1. Clearing and Grubbing | Section 02110 |
| 2. Earthwork | Section 02200 |
| 3. Landscaping | Section 02480 |

PART 2.00 - EXECUTION

2.01 STRIPPING:

A. Procedure:

1. Topsoil shall be carefully removed to the depths and within the limits indicated or directed for removal. Topsoil shall be transported and deposited in storage piles in approved locations convenient to the areas from which it is removed.

END OF SECTION

SECTION 02200 - EARTHWORK

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The work under this Section includes the furnishing of all labor, equipment and materials, and performing all operations in connection with excavating, backfilling, compacting, grading and all other incidental work necessary for the construction of pipelines, structures, pavement and appurtenant work in accordance with the drawings and specifications and as directed. The work also includes installing, shoring and bracing as the excavation proceeds; providing approved earth borrow, sand and bank-run gravel from off-site sources when directed for backfills of excavations and refills of below-grade excavations; excavation and disposal at approved locations of pavements, surplus and unsuitable materials; protection of existing pipelines; utilities and structures and of new work; compaction of trench bottom, backfills and subgrades; excavation and backfilling of test pits; and all other appurtenant work as required or as directed.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Earth Borrow:

Earth borrow shall be a well-graded granular material, of which at least 80 percent by weight shall be retained on the No. 200 sieve. It shall be free from peat, organic matter and debris, and shall not contain any stones or clay lumps in excess of 8 inches in their greatest dimensions. Any materials of whatever description which are too uniformly-graded or saturated to be readily compactible shall not be utilized for earth borrow.

B. Bank-Run Gravel

Bank-run gravel shall be composed of hard, durable stone and coarse to fine sand, free of peat, vegetable or organic matter, clay lumps and any other debris. The gravel refill shall be readily compactible and shall not contain any stones that are in excess of two thirds ($2/3$) of the depth of the layer to be compacted. Bank-run gravel shall conform to the following gradation requirements:

<u>U.S. Standard Sieve Size</u>	<u>Percent Passing By Weight</u>
1 Inch	55-100
No. 4	20-95
No. 40	0-50
No. 200	0-5

C. Gravel Bedding:

Gravel for pipe bedding shall be provided from off-site sources in the quantities required for completion of the work and shall be as approved by the Owner. Gravel bedding shall consist of clean, hard and durable particles or fragments and shall be free from clay, organic matter and other objectionable material. Gravel bedding shall consist of approved 3/4 inch crushed stone or shall consist of gravel conforming to the following gradation limits:

<u>U.S. Standard Sieve Size</u>	<u>Percentage Passing By Weight</u>
3/4 inch	100
3/8 inch	50-85
No. 4	25-70
No. 10	10-35
No. 40	0-10
No. 100	0-5

D. Sand:

Sand shall be provided by the Contractor from sources outside the Owner's property in the quantities required for completion of the work and of the quality specified and approved. Sand shall consist of clean, hard, durable particles or fragments of crushed or uncrushed gravel and shall be free from lumps of clay, organic matter or other objectionable material. Sand shall conform to the following requirements:

<u>U.S. Standard Sieve Size</u>	<u>Percent Passing By Weight</u>
3/8 inch	100
No. 4	95-100
No. 10	65-95
No. 40	20-45
No. 100	0-10

E. Ballast:

Ballast for railroad bedding shall be provided from off-site sources in the quantities required for completion of the

work and shall be as approved by the Owner. Ballasts shall consist of clean hard durable particles or fragments and shall be free from clay, organic matter and other objectionable material.

<u>U.S. Standard Sieve Size</u>	<u>Percentage Passing By Weight</u>
3 inch	100
2½ inch	90-100
2 inch	80-95
1½ inch	35-70
1 inch	20-55
¾ inch	0-15

PART 3.00 - EXECUTION

3.01 EXCAVATION:

A. General:

1. Earth excavation shall include the excavation, removal and satisfactory disposal of all materials of whatever nature encountered from within the limits indicated or specified, or as directed in writing, other than rock or ledge as defined under Section entitled "ROCK REMOVAL". It shall include but not be limited to earth materials such as peat, organic or inorganic silt, clay, sand and gravel; pavements; cobbles and boulders less than 1 cubic yard in volume; soft or disintegrated rock which, in the opinion of the Owner, can be removed without blasting or drilling; brick and concrete masonry; and all obstructions not specifically included in another Section.

END OF SECTION

SECTION 02211 - ROCK REMOVAL

PART 1.00 - GENERAL

1.01 DESCRIPTION:

A. Work included:

The work covered under this Section includes the furnishing of all labor, equipment and materials, and performing all operations in connection with rock excavation and subsequent earth backfill within the payment lines for excavation as indicated on the drawings, and all incidental work in accordance with the drawings and specifications, and as directed. The work shall also include providing and compacting gravel bedding from off-site sources for refilling depressions resulting from removal of boulders; the satisfactory removal and disposal of the excavated rock materials; and the protection of existing pipelines, structures and appurtenant facilities, and the contract work.

PART 2.00 - GENERAL

2.01 ROCK EXCAVATION:

A. Procedure:

1. Rock excavation shall include the excavation, removal and disposal of all boulders and detached rock fragments 1 cubic yard or more in volume; and all ledge rock, the removal of which, in the opinion of the Owner, can be accomplished only by drilling and splitting mechanically or by hand or by blasting. Boulders of less than 1 cubic yard in volume, and all soft or disintegrated rock which can be removed without the manipulation noted above, shall be classified as "earth excavation".

END OF SECTION

SECTION 02271 - RIPRAP

PART 1.00 - GENERAL

1.01 WORK INCLUDED:

The work covered under this Section consists of the furnishing of all materials as specified, plant, labor, and equipment, and performing all operations in connection with the furnishing and placing of stone riprap. All shall be in accordance with the Contract Drawings and as hereinafter specified.

PART 2.00 - MATERIALS

2.01 GENERAL

Stone riprap material shall be furnished by the Contractor from approved sources. The materials for use as riprap shall consist of quarried rock composed of hard, durable, angular and sound rock fragments.

PART 3.00 - EXECUTION

3.01 GENERAL

Stone riprap shall be placed to the lines and grades as shown on the Contract Drawings and as specified.

END OF SECTION

SECTION 02278 - FILTER CLOTH

PART 1.00 - WORK INCLUDED

The work covered by this Section consists of furnishing all plant, labor and equipment and performing all operations in connection with the placement and securing of all filter fabric, complete, in place, in accordance with the Contract documents.

PART 2.00 - MATERIALS

2.01 FILTER CLOTH

A. The plastic filter cloth shall be a pervious sheet woven of polypropylene monofilament yarns. Filter cloth shall be Poly-Filter X as manufactured by Carthage Mills, Cincinnati, Ohio; Monofilter as manufactured by United States Filter Corporation, Houston, Texas; or an approved equal. To satisfy the requirements of this specification, the type of plastic filter cloth used must have a service record of not less than 5 years in projects of a generally similar nature.

B. Mill Certificate:

A mill certificate must be provided by the manufacturer that the filter cloth to be supplied conforms to these specifications.

C. Filter Cloth shall be made of a yarn consisting by weight of at least 85 percent propylene ethylene or vinylidene - chloride and contain stabilizers and inhibitors added to the base plastic to make the filaments resistant to ultra-violet and heat deterioration. After weaving, the cloth shall be calendered and palmered so that the filaments retain their relative positions with respect to each other. All edges of the cloth shall be salvaged and/or serged. The plastic filter shall be free of defects or flaws which significantly affect its physical and/or filtering properties. A competent laboratory must be maintained by the producer of the cloth at the point of manufacture to insure quality control.

PART 3.00 - EXECUTION

3.01 GENERAL

A. The filter cloth shall be placed in the manner and at the locations indicated on the drawings. The surface to receive the cloth shall be prepared to a smooth condition, free of obstructions, depressions and debris as specified and directed. The cloth may be placed with the long dimension either perpendicular or parallel to the slope as approved.

END OF SECTION

SECTION 02369 - STEEL SHEET PILING SYSTEM

PART 1.00 - GENERAL

1.01 WORK INCLUDED:

The work covered under this Section consists of the furnishing of all materials, plant, labor and equipment, and performing all operations in connection with the furnishing and construction of a steel sheet piling system. All shall be in accordance with the Contract Drawings and as herein specified.

PART 2.00 - MATERIALS

2.01 Structural steel tie rods, wales, bolts, accessory materials and plate washers shall conform to ASTM A-36. Welding electrodes shall be E70XX. Protective coatings shall be in accordance with the Protective Coatings Section of these Specifications.

2.02 Turnbuckles shall conform to ASTM A-668 and shall be normalized and tempered and shall have a yield point of not less than 40,000 psi. Weights and dimensions shall be as shown in the Cleveland City Forge Co. Standard.

2.03 Sheet Piling:

Steel sheeting piling shall be manufactured from a steel possessing improved corrosion resistance to marine environments, having a guaranteed minimum yield point of 50,000 pounds per square inch and shall conform to ASTM A 690-77 steel sheet piling shall be of the continuous inter-lock type of approved form.

PART 3.00 - EXECUTION

3.01 GENERAL

Unless otherwise directed, piles shall be driven to the tip elevation shown. If a pile fails to reach the indicated tip elevation, corrective measures shall be applied as recommended by the Owner or his representative. Adequate guide wales shall be provided to align the piles properly. Piles shall be spaced accurately and driven true and plumb to a tolerance from the vertical of not more than 0.25 inches per foot of pile length. At completion of driving, tops of piles shall be within 3 inches of the location indicated. Manipulation of piles to force them into proper position shall not be permitted. Sequence of driving shall be such that no pile is advanced farther than three feet below the adjacent pile. Jetting of piles will not be permitted. Piles damaged during driving shall be withdrawn and replaced and all costs associated therewith shall be borne by the Contractor.

END OF SECTION

SECTION 02380 - EXCAVATION SUPPORT SYSTEMS

PART 1.00 - GENERAL

1.01 DESCRIPTION:

A. Work Included:

The work covered under this Section includes the furnishing of all labor, equipment and materials and performing all operations in connection with the furnishing, installation, maintenance and removal of all timber sheeting and bracing and all temporary and permanent steel sheeting and bracing necessary to permit the proper and satisfactory installation and construction of the work; to prevent injurious caving or erosion, or loss of ground, to maintain at all times pedestrian, vehicular and railroad traffic on public and private streets, property and rights-of-way; or where shown on the drawings, necessary for unforeseen reasons, or where directed by the Owner, and all in accordance with the specifications and the drawings and as directed.

PART 2.00 - PRODUCTS

2.01 MATERIALS:

A. Timber sheeting and bracing:

Timber sheeting and bracing may be of any species of wood which will satisfactorily withstand all driving and construction stresses and the loads to which the members will be subjected. Sheeting shall not be less than 3 inches nominal thickness. All timber sheeting and bracing shall be free from wormholes, windshakes, loose knots, decayed or unsound portions or other defects which might impair its strength or tightness.

B. Steel Sheeting:

The shapes, sizes, and lengths of steel sheeting to be utilized are optional with the Contractor, providing they are satisfactory to withstand all driving and construction stresses and are driven in continuous interlock. Bracing and other supports whether of steel or of timber, shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects which might impair this strength.

C. Hardware and Fastenings:

The Contractor shall provide all necessary hardware and fastenings necessary in connection with satisfactory installation of all sheeting and bracing.

PART 3.00 - EXECUTION

3.01 INSTALLATION AND REMOVAL:

A. Installation:

1. Sheeting and bracing shall be of sufficient strength to safely sustain all loads from the sides of the excavations together with all water pressure and reasonable surcharge. The Contractor shall at all times be entirely responsible for adequacy of sheeting and bracing used to permit the satisfactory and safe installation and construction of the work, to provide adequate protection against damage to all existing utilities, structures and complete portions of the work, and to prevent injury to persons.

END OF SECTION

SECTION 02401 - DEWATERING, CONTROL AND DIVERSION
OF WATER

PART 1.00 - GENERAL

1.01 DESCRIPTION:

A. Work included:

The work covered under this Section includes the furnishing of all labor, equipment and materials, and performing all operations in connection with the dewatering, control and diversion of water, and all other operations necessary to maintain in the dry condition all excavations and work areas of this contract. The Contractor shall be responsible for providing, maintaining, operating and removing all dewatering, and other facilities, including all pumping and appurtenant equipment, required to maintain in a dry condition the areas in which construction of this contract is to be conducted. The Contractor shall be responsible for performing all required dewatering in a manner to prevent injury to persons or public health and damage to existing facilities or the work in progress.

PART 2.00 - EXECUTION

2.01 DEWATERING EXCAVATIONS:

A. Procedure:

1. The excavations for work required under this contract are to some extent below existing ground water levels. The Contractor shall provide, operate and maintain all pumps, drains, well points or any equipment necessary for the control, collection and disposal of all surface and subsurface water encountered in the performance of the contract work.

END OF SECTION

SECTION 02444 - CHAIN-LINK FENCING

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Chain-link fencing described in this Section includes fencing, concrete, all hardware and installation complete in place as indicated on the Drawings.

1. Six-foot high PVC coated chain-link fencing.

B. Related Work Described Elsewhere:

1. Cast-in-Place Concrete Section 03300

PART 2.00 - PRODUCTS

2.00 - GENERAL

2.01 GALVANIZED FENCING

A. Posts for Six-foot Fencing:

1. Line posts shall be heavy hot-dip galvanized steel pipe having an outside diameter of 2 inches and shall weigh 2.72 pounds per linear foot respectively.
2. End, corner and pull posts shall be heavy hot-dip galvanized steel pipe having an outside diameter of 2-1/2 inches and shall weight 3.65 pounds per linear foot.

B. Top and Brace Rails:

Top and brace rails shall be heavy hot-dip galvanized steel pipe having an outside diameter of 1-5/8 inches and weighing 2.27 pounds per linear foot.

C. Diagonal Braces:

Diagonal braces (truss rods) shall be hot-dip zinc-coated steel, 1/2 inch diameter.

D. Fence Fabric:

Fence fabric shall be grey colored PVC coated 9-gauge pre-galvanized wire interwoven into a 3-inch by 5-inch mesh.

E. Fence Hardware:

1. Line posts shall have cast semi-steel loop caps.

2. End, corner, and pull posts shall have malleable iron hot-dip galvanized post tops.
3. Top and brace rail hardware shall include hot-dip galvanized self-centering outside sleeve type couplings at least seven inches long, heavy hot-dip galvanized steel brace bands, and malleable iron rail end connections.
4. Fabric attachment hardware shall include 1/4-inch thick by 3/4-inch wide by full height galvanized steel stretcher bars, stretcher bar bands, 7 gauge galvanized coil spring tension wire, and 6 gauge zinc-coated wire hot ties at 14-inch intervals.
5. Diagonal brace (truss rod) hardware shall include heavy malleable iron hot-dip galvanized tightener and brace band.

PART 3.00 - EXECUTION

3.01 INSTALLATION

Install all chain-link fencing in strict accordance with all pertinent codes and regulations, the original design, the approved Shop Drawings, and the manufacturer's current recommendations, anchoring all components firmly into position for long life under hard use.

A. Alignment and Grade:

Fencing shall be installed to the alignment and grades indicated or directed. Fencing shall follow the general contour of the finished ground grade or the top of walls, unless otherwise indicated or directed.

B. Post Spacing:

Line posts shall be spaced equidistant in the fence line on a maximum of 10-foot centers. Posts shall be plumb and the tops of the posts properly aligned.

C. Post Setting:

1. Posts at grade shall be set in concrete footings with the top exposed surface sloped to shed water. Line posts shall be set not less than 36 inches deep in concrete footings having a depth of 39 inches and a diameter of 12 inches. Terminal, corner, gate and pull post footings shall be 18 inches in diameter.

END OF SECTION

SECTION 02500 - BITUMINOUS PAVING AND PATCHING

PART 1.00 - GENERAL

1.01 - DESCRIPTION

A. Work Included:

The work of installing bituminous concrete for road and walk pavements and patching includes, but is not necessarily limited to:

1. Saw cutting.
2. Preparation of subbase.
3. Installing and compacting gravel base material.
4. Bituminous concrete paving materials.

B. Related work described elsewhere:

- | | |
|---------------|---------------|
| 1. Earthwork | Section 02200 |
| 2. Demolition | Section 02050 |

C. References:

Within this section, the State of Rhode Island Standard Specifications for Road and Bridge Construction Revision of 1971 with changes will be referred to as the "State Standards". All reference to measurement and payment within said "State Standards" shall not apply.

PART 2.00 - PRODUCTS

2.01 - SUBGRADE MATERIAL

Subgrade fills and refills shall consist of approved on-site materials conforming to the requirements of Section 02200.

2.02 - SUBBASE MATERIAL

The subbase material shall conform to the requirements of Section 02200.

2.03 - BITUMINOUS CONCRETE PAVEMENT MATERIALS

The materials for the bituminous concrete mixture, the sources of supply, formula for mix, mix tolerances, approval of mix formula, and the control of the mixture shall conform to the requirements of Section M.03 of the "State Standards."

2.04 - OTHER MATERIALS

All other materials, not specifically described but required for proper and complete installation of bituminous concrete pavement, shall be as selected by the Contractor subject to the approval of the Owner.

PART 3.00 - EXECUTION

3.01 - SURFACE CONDITIONS

A. Inspection:

1. The Contractor shall perform and complete the construction work within the limits indicated in a continuous manner and so that the pavement replacement work may proceed without delay.
2. The work consisting of trench patching and road and walk paving shall be performed to details indicated and as specified.
3. Existing pavements, outside of the indicated pavement limits, which are damaged as a result of the Contractor's operations, shall be replaced including base courses, bituminous tack coats where directed and surface courses, by the Contractor, in accordance with the requirements specified herein for the respective type of pavement and in a manner satisfactory to the Owner and at no additional expense to the Owner.

END OF SECTION

SECTION 02718 - DOMESTIC AND FIRE WATER SERVICE

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The work covered under this Section includes, but is not necessarily limited to:

1. Installing and testing ductile iron and type "K" copper water pipe fittings, valves and all appurtenant items.
2. Installing corporation stops, tapping sleeves, valves, boxes and hydrants.
3. Installing miscellaneous metal for strapping, piping, and accessories.
4. Installing cement-concrete for thrust blocks.
5. Disinfection.
6. Obtaining permits.

B. Related Work Described Elsewhere:

- | | |
|---------------------------------|---------------|
| 1. Earthwork | Section 02200 |
| 2. Bituminous Paving & Patching | Section 02500 |

PART 2.00 - EXECUTION

2.01 GENERAL REQUIREMENTS

Piping for water mains, water services and appurtenances shall be of the types and materials specified herein. The pipe, fittings, special accessories and appurtenances shall be new and unused, and as approved. The interior of the pipe shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by plugging or other approved method. The full-length of each section of piping shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water, or when trench or weather conditions are unsuitable for the work, except by permission of the Owner. Water shall be kept out of the trench until the joints have been completed. Any section of pipe found to be defective before or after laying shall be replaced by the Contractor with sound pipe without additional expense to the Owner. All bends, tees and other locations indicated or directed shall be firmly reinforced with concrete thrust blocks of the size

and shape indicated and as directed, and strapped where required, to prevent the pipe, pipe fittings and appurtenances from being blown off the lines under pressure. Where connections are made between new and existing work, the connections shall be made using the specials and fittings specified as indicated or as required. All connections between new work and existing work shall only be made at such times and in a manner approved by the Owner. Approximate locations of connections between new and existing work are shown on the Drawings, the exact location shall be as directed by the Owner. The Contractor shall make the necessary excavations as directed to uncover existing work for the purpose of determining the exact locations for all connections of new work to existing work.

END OF SECTION

SECTION 02721 - STORM DRAINAGE SYSTEMS

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The storm drainage system installations are indicated on the drawings and include, but are not necessarily limited to:

1. Reinforced concrete pipe and appurtenances
2. Catch basins, manholes, frames and grates

B. Related Work Described Elsewhere:

- | | |
|------------------|---------------|
| 1. Earthwork | Section 02200 |
| 2. Rock Removal | Section 02211 |
| 3. Cast-in-Place | Section 03300 |

PART 2.00 - MATERIALS

2.01 GENERAL

All reinforced concrete pipe, catch basins, manholes and appurtenances shall conform to Section M.04 of the State of Rhode Island Standard Specifications.

PART 3.00 - EXECUTION

3.01 GENERAL

After the trenching and excavation has been completed as specified in Section 02200 of these specifications, the catch basins, manholes and drainage pipe shown on the contract drawings shall be installed in conformance with the methods outlined in Section 701 of the State Standards.

END OF SECTION

SECTION 02722 - SANITARY SEWER

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The work covered under this Section includes, but is not necessarily limited to:

1. Installing sewer piping and manholes to the lines and grades as shown on the contract drawings.
2. Interconnection with existing sanitary sewer system.
3. Providing test reports and certificates of compliance.
4. Performing leakage tests.

B. Related Work Described Elsewhere:

1. Earthwork Section 02200
2. Bituminous Paving and Patching Section 02500

PART 2.00 - MATERIALS

2.01 PIPE

1. Asbestos cement sewer pipe and pipe fittings shall meet the requirements of ASTM Designation: C428, as needed to date Class 3300, Type II; size 10" shall meet the requirements of ASTM Designation; C644 as amended to date, Class 2400, Type II.

2. Physical and Chemical Properties:

The pipe shall be sulphate resisting and shall contain no more than 1 percent uncombined calcium hydroxide (free lime) when tested in accordance with the uncombined calcium hydroxide test as described in AWWA C-400 or ASTM C-500.

3. Marking:

Pipe shall be marked along the outside of the barrel in bold style type and shall indicate the manufacturer's name, pipe size, class and date of shipment. Each coupling shall be clearly marked with the trade name, size and class of the pipe with which it is designed to be used.

PART 3.00 - EXECUTION

3.01 PIPE

1. All pipe and accessories shall be of new and unused material and shall be laid true to the lines and grades indicated on the drawings. The pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the Owner. Water shall be kept out of the trench until joints have been completed and the trench backfilled and tamped to at least twelve (12) inches above the top of the pipe. When work is not in progress, the open ends of the pipe shall be closed, in such a manner as to prevent the entry of groundwater, earth or foreign materials.
2. The bottom of the trenches shall be accurately graded to provide bedding which consists of a uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for the portion of the pipe sections where it is necessary to excavate for bell holes and for tye proper seating of pipe joints. See typical pipe bedding detail on plans. Collar holes and depressions for joints shall be dug after the trench bottom has been graded and, in order that the pipe rests on the prepared bottom for as nearly its full length as practicable, bell holes and depressions shall be only of such length, depth and width as required for properly making the particular type of joint. Except where rock is encountered, care shall be taken not to excavate below the depths indicated.

END OF SECTION

SECTION 02819 - LOAMING AND GRASSING

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Areas to be provided with loam and grass are indicated on the Drawings and include, but are not necessarily limited to:

1. Furnishing and placing 6" of loam.
2. Liming and fertilizing.
3. Seeding.

B. Related Work Described Elsewhere:

- | | |
|------------------------------|---------------|
| 1. Earthwork | Section 02200 |
| 2. Stripping and Stockpiling | Section 02113 |

PART 2.00 - MATERIALS

2.01 LOAM

- A. All loam necessary to complete the work shall be provided by the Contractor from on-site stockpiles and, for such additional quantities as may be required, from an approved source off the site. The loam shall be natural, friable and possessing characteristics of the soils of the vicinity which produce a heavy growth of crops, grass or other vegetation and shall be light to dark brown in color. The loam shall be reasonably free from subsoil, clay, lumps, stones, stumps, roots and similar objects, any of which are larger than one inch in diameter, brush, objectionable weeds or other litter, excess acid or alkali or any other material or substance which may be harmful to plant growth or a hindrance to grading and maintenance operations.

2.02 SEED MIX

The seed mix for those areas designated to be seeded shall be composed of the following seeds mixed in the proportions by weight and testing the minimum percentages of purity and germination as follows:

<u>Type of Seed</u>	<u>Proportion by Weight Percent</u>	<u>Percent of Purity</u>	<u>Percent Germination</u>
Penn Lawn Chewing Fescue	40	95	88
Kentuckey Bluegrass	25	95	90
Merion Bluegrass	25	95	90
Domestic Rygrass	10	98	90

PART 3.00 - EXECUTION

3.01 PREPARATION OF SUBGRADE

- A. Clearing: Areas upon which loam is to be placed shall be cleared of all vegetation, stones, and roots larger than one inch in diameter, brush, debris and any other material which might interfere with or be harmful to plant growth.
- B. Grading: The subgrade of all areas on which loam is to be placed shall be brought to an elevation 6" below the proposed finished grade of all seeded areas. All filling, excavating and grading shall be done to produce a subgrade at the proper elevation free of depressions and irregularities.
- C. Discing: After subgrades of the areas to be loamed have been satisfactorily brought to the proper condition, elevations and contours, and immediately prior to placing, and spreading the loam, the subgrade shall be loosened by discing, scarifying, or other approved method.

SECTION 02850 - RAILROAD WORK

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The railroad trackage and installations are indicated on the Contract Drawings and include, but are not necessarily limited to:

1. The laying and ballasting of the tracks shown
2. Switches and control mechanisms

B. Related work described elsewhere:

1. Earthwork
2. Storm Drainage

2.00 - MATERIALS

2.01 GENERAL

All materials shall conform to applicable specifications of A.R.E.A. Manual, latest edition.

2.02 WOODEN CROSS TIES

Cross ties shall be creosote treated 10 lb. to the cubic foot oak or pine; minimum dimensions 9 inches wide by 7 inches thick by 8 feet 6 inches long.

2.03 STEEL RAILS

Rails shall be new or relay rail having a minimum of 100 lbs. per yard nominal weight, included shall be all splice bars, bolts, nuts, washers as required.

2.04 SWITCHES

All switches, switch stands, frogs, guard rails, etc. shall be of new manufacture.

PART 3.00 - EXECUTION

3.01 PLACING TIES

Ties shall be spaced at 20"± center to center. Ties shall be laid with the wider face down and normal to the center line of the track. Space shall be equidistant from rail joints and support rails at end of splice bars. One end of the ties shall be aligned. Ties shall be moved only with tongs.

3.02 TRACK LAYING

Rail shall be laid with staggered joints; i.e. the joints on rail shall be located as nearly as possible opposite the middle of the other rail. Temporary shims shall be used to secure proper spacing between ends of rail, and the rail temperature at the time of laying shall determine the number and thickness of the shims required.

END OF SECTION

SECTION 02881 - DREDGING

PART 1.00 - GENERAL

1.01 DESCRIPTION

The dredging work to be performed under this Contract consists of all operations required for satisfactory removal and disposal of all materials encountered within the lines and to the grades as shown on the Contract Drawings for dredging. Dredging and disposal of dredged material shall be in strict compliance with all local, state and federal regulatory agencies.

PART 2.00 - EXECUTION

2.01 GENERAL

- A. The Contractor shall obtain and assemble the necessary equipment, plant and material required for accomplishment of the work under this section of the Contract.
- B. The Contractor shall use reasonable and proper care in the prosecution of his work to assure the stability of the existing wall and new structures adjacent to the site of the work, insofar as they may be jeopardized by the operation of dredging and by the moving of equipment.
- C. The Contractor shall conduct his operations in strict compliance with all local, State, and Federal regulatory agencies.

END OF SECTION

SECTION 02882 - FENDERS, BOLLARDS AND CLEATS

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

The work under this section includes the furnishing of all labor, equipment and materials, and performing all operations in connection with the installation of fenders, bollards and cleats.

B. Related Work Specified Elsewhere:

1. Cast-in-Place Concrete: Section 03300

PART 2.00 - MATERIALS

2.01 FENDERS

The Fender Systems shall consist of all rubber fender units and all accessories and hardware for mounting of the units as shown on the contract documents. Shop drawings and certificates of compliance shall be submitted by the Contractor and approved by the Engineer prior to installation.

2.02 BOLLARDS

Bollards shall be cast steel, Navy standard type. They shall be capable of resisting an allowable fitting load of 200 kips at 30° with the horizontal. Shop drawings and certificates of compliance shall be submitted by the Contractor and approved by the Engineer prior to installation.

2.03 CLEATS

Cleats shall be 42-inch, cast steel, Navy standard type. They shall be capable of resisting an allowable fitting load of 50 kips at 30° with the horizontal. Shop drawings and certificates of compliance shall be submitted by the Contractor and approved by the Engineer prior to installation.

PART 3.00 - EXECUTION

3.01 FENDER UNITS

Fender units shall be installed directly to embedded inserts. Inserts shall be embedded during the placing of concrete. No field drilling of holes will be allowed prior to installation of insects. All dimensions shall be checked with the manufacturer's shop drawings by the Contractor.

3.02 BOLLARDS AND CLEATS

Bollards and cleats shall be installed and shall be leveled and properly anchored with nuts drawn tight and threads upset. After all bolted connections are made, the recessed bolt holes shall be filled with lead. All bollards shall be filled with concrete. Dimensions shall be checked with the manufacturer's shop drawings prior to embedment of hardware in the concrete.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Cast-in-place concrete required for this work is indicated on the Drawings and includes, but is not necessarily limited to:

1. Pile cap
2. Headwalls

B. Related Work Described Elsewhere:

- | | |
|-----------------------|---------------|
| 1. Steel Sheetpiling: | Section 02369 |
| 2. Storm Drainage: | Section 02721 |

PART 2.00 - PRODUCTS

2.01 CONCRETE

A. Cement:

1. All cement shall be Portland Cement conforming to ASTM C-150, Type I or II, and shall be the product of one manufacturer.

B. Aggregates:

1. All aggregates shall conform to ASTM C-33-71, "Specifications for Concrete Aggregates".
2. Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the appropriate grading requirements of ASTM C-33.

C. Water:

All water shall be clean and free from deleterious matter. Where possible, water shall be from the municipal supply.

D. Admixtures:

1. All concrete shall contain entrained air. Air-entraining admixtures shall be "MB-AE 10" as manufactured by Master Builders, "Sika AER" as manufactured by Sika Chemical Corp., or an approved equal and shall conform to ASTM C-260-73.

2.02 CONCRETE REINFORCEMENT:

All concrete reinforcement materials shall be new, free from rust, and shall comply with the following reference standards:

- A. Bars for reinforcement: "Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement", ASTM A-615-Grade 60.
- B. Wire fabric: "Specifications for Wire Fabric for Concrete Reinforcement", ASTM A-185.

2.03 METAL ACCESSORIES:

- A. Metal Accessories, including spacers, chairs, ties and other devices necessary for proper assembling, placing, spacing and supporting all reinforcement in place shall be provided. Specifications for these products shall be in conformance with PS7-66 of the National Bureau of Standards, Department of Commerce, "Wire Bar Supports for Reinforced Concrete Construction". These standards are also contained in the Concrete Reinforcing Steel Institute "Manual of Standard Practice".
- B. Bar supports for interior concrete reinforcing shall be Class A - bright basic bar supports; bar supports for exterior and exposed to view concrete reinforcing shall be Class C - plastic protected bar supports.

2.04 OTHER MATERIALS:

All other materials, not specifically described but required for a complete and proper installation of concrete reinforcement, shall be as selected by the Contractor subject to the approval of the Owner's Representative.

PART 3.00 - EXECUTION

Cast-in-place concrete shall be placed to the lines and grades as shown on the Drawings and as specified herein.

END OF SECTION

SECTION 16400 - ELECTRICAL SERVICE

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work included:

The electrical work includes the following:

1. Complete primary distribution system
2. Complete grounding system
3. Fire alarm system
4. Street lighting

B. Work Specified Elsewhere

1. The responsibility for electrical work and items in connection with electrically operated equipment furnished by others or under other Sections of these Specifications is as follows:
2. Connections to telephone equipment and telephone wiring will be installed by the Telephone and Telegraph Company, but the work under this section shall include the installation of all necessary poles and raceways for telephone cables.
3. Excavating, backfilling, concrete work, grading, and paving shall be performed under other Sections of the Specifications. Backfilling shall be done in a careful manner, using the same earth carefully tamped in not over one foot layers with all rocks, rubbish, and frozen earth removed. The provisions of the applicable sections of the Specifications shall apply to all excavating and backfilling to be done under this Section.
4. Concrete work shall be performed under applicable Sections of the Specifications.

PART 2.00 - EXECUTION

2.01 MATERIALS AND WORKMANSHIP

- A. All materials shall be new and shall conform with the standards of the Underwriters' Laboratories, Inc. in every case where such a standard, listing, or label has been established for the particular type of material in question.
- B. Laws and Regulations: The installation, including temporary service for construction, shall comply with all state

and local laws and regulations applying to electrical installations in Hawaii, with all applicable requirements of the National Electrical Code and its latest revisions (1980) and with the requirements of the Telephone and Telegraph Company and the Light & Power Company where such requirements do not conflict with the laws and regulations in effect.

- C. The Contractor shall obtain all necessary permits.

2.02 DRAWINGS

- A. The drawings show the layout of the electrical system and indicate the approximate location of outlets, apparatus, and equipment. The exact routing of conduit runs shall be determined by structural conditions.
- B. Manufacturer's shop drawings and catalog cuts shall be provided for all necessary equipment.

2.03 GUARANTEE

- A. This Contractor shall guarantee all systems, including fixtures, as to be free from short circuits, open circuits, loose connections, overheating, and such other defects.

2.04 TEMPORARY LIGHT AND POWER

- A. Provide all necessary light and power necessary for construction.

2.05 TYPES OF SERVICES

- A. Power from the existing substation will be 33,000 volts, 3 phase, 3 wire, 60 hertz.
- B. Power for street lighting will be 120/240 volts, single phase, 3 wire, 60 hertz from distribution transformers.
- C. Secondary racks shall be 3 of 4-spool, as indicated and shall be complete with high glaze, spool type, porcelain insulators. Racks and insulator points shall be made of steel, not lighter than 9-gauge, shaped to prevent twisting and bending.
- D. Anchor rods shall be double galvanized steel conforming to ASTM Designation: A 107-46 and A 158-42T.
- E. Guys shall be provided for end poles as indicated and specified herein. Guys shall be 7-wire strand, 7/16 inch nominal diameter, extra high strength grade with a breaking strength of not less than 20,000 pounds.

- F. Guy anchors shall be of the expanding (long type) in solid ground, swamp type in soft, marshy or muddy soil, and rock wedge (expanding) in ledge, designed to distribute the holding power of the anchors over a wide area and suitable for use in the type of soil encountered at the anchor.
- G. Lightning arrestors shall conform to the applicable recommendations and requirements of the National Manufacturers Association Standard.
- H. Primary fuse cutouts shall be the indicating non-dropout, extra heavy duty type. Open-link rural type cutouts will not be permitted.

2.06 DISTRIBUTION TRANSFORMERS

- A. Distribution transformers shall be single phase, oil filled with two 2-1/2 percent full capacity tape above and below normal and shall be arranged for pole mounting.
- B. Transformers shall be rated 33KV/13.8KV, 3 phase, 3 wire, 60 hertz and 13.8 KV/120-240 volts, single phase 3 wire, 60 hertz.

2.07 COORDINATION

- A. The Contractor shall be responsible for fully coordinating all of the various parts of the work included under this section, and such other work of this contract as it may affect the work of this section, throughout the various phases of construction and before the ordering of fabrication of the various parts of the work, so as to insure compliance with the drawings and specifications, and as necessary to provide the installation complete and in satisfactory operating conditions.

2.08 FIRE ALARM SYSTEM

- A. All equipment shall be listed by the Underwriters' Laboratories, Inc., and the complete installation shall be made in accordance with the applicable requirements of the latest edition of NFPA Pamphlet No. 72B for auxiliary systems. Provide street boxes with codes compatible with the base system.
- B. Fire alarm cable will conform to IMSA Specifications and be messenger supported.

2.09 OVERHEAD CONSTRUCTION

- A. Poles for the overhead distribution shall be wood and meet the National Electrical Safety Code for wind loading in the area.

- B. Crossarms shall be wood with steel pins.
- C. Insulators shall meet NEMA standards for the voltage applied to the system.
- D. New construction shall conform as to strength, clearance, loading, and workmanship to the best commercial practice and to all standards and requirements of the National Electrical Safety Guide for Class B construction. These shall be minimum requirements. Proper clearances shall be made on the poles and/or structures for secondary and primary circuits.
- E. All materials used shall meet the applicable requirements of standard ASTM, ASA, NEMA, AIEE, and EEI.
- F. Unless otherwise indicated or specified herein, the overhead primary installation shall conform with EEI and NEMA specifications. Standard mounting brackets suitable for cross-arm mounting shall be provided for the installation of the lightning arresters, disconnecting switches, and transformers.
- G. Materials:
 - 1. Wire for aerial installation, primary and secondary shall be medium hard drawn copper, neoprene, weatherproof, and shall be in accordance with the latest IPCEA specifications.
 - 2. Poles shall be full-treated Southern Pine reasonably free of knots or knotholes, and straight-grained conforming to American Standard C 5-1.

2.10 SUBSTATION CIRCUIT BREAKER

- A. Circuit breaker shall be vacuum, oil, or gas filled with high voltage bushing on the top. Units shall be free standing with its own control cabinet.
- B. Breakers shall meet ANSI, NEMA, and IEC Standard.
- C. Breakers shall have the following ratings:
 - (1) 46KV
 - (2) 2,000 ampere continuous
 - (3) 1,500 MVA interrupting
 - (4) Interrupting time 3 cycles
 - (5) 60 hertz
 - (6) KV insulation level 105.
- D. Relays shall be provided as indicated. Where indicated, breakers shall have synchronizing capabilities.

2.11 MANHOLES

- A. Manholes shall be of precast or cast-in-place concrete type with cable racks, ladders, pulling irons, and heavy duty covers.
- B. Manholes shall be duplex construction, one for power and one for telephone and fire alarm.

2.12 CABLES

- A. Medium voltage cables shall be rated 35 KV, ungrounded and 15 KV, ungrounded, 19 strand bare copper conductors, strand shield, 220 mils, ethylenepropylene insulation, semi-conducting tape, bare copper shield, and overall PVC jacket.
- B. Stress cones shall be provided for all medium voltage terminations.
- C. High voltage D.C. tests shall be provided after installation.

2.13 DUCT

- A. Site raceway system will consist of concrete encased fiber duct.

END OF SECTION

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